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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,833	10/29/2003	Min-Hsun Hsieh	KYCP0013USA	2832

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NORTH AMERICA INTERNATIONAL PATENT OFFICE (NAIPC)
P.O. BOX 506
MERRIFIELD, VA 22116

EXAMINER	
RIELLEY, ELIZABETH A	

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H·A

Office Action Summary	Application No.	Applicant(s)	
	10/605,833	HSIEH ET AL.	
	Examiner	Art Unit	
	Elizabeth A. Rielley	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 7, 10-13, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiyo et al (US 6100545) in view of Yamazaki et al (US 20030062519).

4. In regard to claims 1 and 10-13, Chiyo et al ('545) teach a nitride light-emitting device having an adhesive reflecting layer (1; figure 18; column 2 lines 43-47; column 1 lines 61-62) comprising: a metal reflecting layer comprising of at least one material selected from a material group consisting of In, Sn, Al, Au, Pt, Zn, Ag, Pb, Pd, Ge, Cu, AuBe, AuGe, Ni, PbSn, and AuZn, or other substitute materials[1](1; column 2 lines 42-47; figure 18), having an upper surface and a lower surface (see figure 18); a first

reaction layer formed over the upper surface of the metal reflecting layer wherein the first reaction layer comprises at least one material selected from a material group consisting of SiNx, Ti, and Cr, or other substitute materials (2; figure 18); a second reaction layer formed over first reaction layer (3) wherein the second reaction layer comprises at least one material selected from a material group consisting of SiNx, Ti, and Cr, or other substitute materials (column 2 lines 27-35); a nitride light-emitting stack layer formed over the second reaction layer (5; column 2 lines 43-45), the nitride light-emitting stack layer comprising a first surface and a second surface (see figure 18); a first electrode formed over the first surface (9); and a second electrode formed over the second surface (8; column 10 line 20 to column 11 line 10). Chiyo et al ('545) are silent regarding the limitation a transparent adhesive layer formed between the first and second reaction layers. Yamazaki et al ('519) teach a transparent adhesive layer formed between two reaction layers (paragraphs 35-37) wherein the transparent adhesive layer comprises at least one material selected from a material group consisting of Pl, BCB, and PFCB, or other substitute materials (paragraphs 35-37), in order to ensure a secure bond. Hence it would have been obvious to one of ordinary skill in the art to combine the light-emitting device of Chiyo et al with the bonding layer of Yamazaki et al. Motivation would be to ensure a more secure bond.

5. In regard to claims 7 and 21, Chiyo teaches a second substrate (4)formed between the second reaction layer (3) and the light-emitting stack layer (5) comprising at least one material selected from a material group consisting of $Al._2O_3$, SiC, ZnO, and GaN, or other substitute materials (column 10 lines 35-40).

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[1] http://www.reade.com/Products/Minerals_and_Ores/sapphire.html

6. Claims 2-4, 6, and 14-20, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiyo et al (US 6100545) in view of Yamazaki et al (US 20030062519) and in further view of Uemura et al (US 2001/0028062)

7. In regard to claims 2 and 14-18, Chiyo/Yamazaki teach all the limitations set forth, as described above, except the nitride light-emitting stack layer comprises a nitride first contact layer, the nitride first contact layer comprising a first surface and a second surface; a nitride first cladding layer formed over the first surface; a nitride light-emitting layer formed over the nitride first cladding layer; a nitride second cladding layer formed over the nitride light-emitting layer; and a nitride second contact layer formed over the nitride second cladding layer; wherein the nitride first contact layer comprises at least one material selected from a material group consisting of GaN, InGaN, and AlGaN, or other substitute materials, wherein the nitride first cladding layer comprises at least one material selected from a material group consisting of AlN, GaN, AlGaN, InGaN, and AlInGaN, or other substitute materials, wherein the nitride light-emitting layer comprises at least one material selected from a material group consisting of GaN, InGaN, and AlInGaN, or other substitute materials, wherein the nitride second cladding layer comprises at least one material selected from a material group consisting of AlNGaN, GaN, AlGaN, InGaN, and AlInGaN, or other substitute materials, wherein the nitride second contact layer comprises at least one material selected from a material group consisting of GaN, InGaN, and AlGaN, or other substitute materials.

Uemura et al ('062) teach the nitride light-emitting stack layer (figure 1) comprises a nitride first contact layer (13; paragraphs 81-105), the nitride first contact layer comprising a first surface and a second surface (see figure 1); a nitride first cladding layer formed over the first surface (14); a nitride light-emitting layer formed over the nitride first cladding layer (15); a nitride second cladding layer

formed over the nitride light-emitting layer (16); and a nitride second contact layer formed over the nitride second cladding layer (17). Wherein, wherein the nitride first contact layer comprises at least one material selected from a material group consisting of GaN, InGaN, and AlGaN, or other substitute materials (paragraph 83). Wherein the nitride first cladding layer comprises at least one material selected from a material group consisting of AlN, GaN, AlGaN, InGaN, and AlInGaN, or other substitute materials (paragraph 83). Wherein the nitride light-emitting layer comprises at least one material selected from a material group consisting of GaN, InGaN, and AlInGaN, or other substitute materials (paragraph 84). Wherein the nitride second cladding layer comprises at least one material selected from a material group consisting of AlNGaN, GaN, AlGaN, InGaN, and AlInGaN, or other substitute materials (paragraph 84). Wherein the nitride second contact layer comprises at least one material selected from a material group consisting of GaN, InGaN, and AlGaN, or other substitute materials (paragraph 84). Uemura et al ('062) states that this structure will increase both the luminous output and the lifetime of the light-emitting device.

Hence, it would have been obvious at the time of the invention to one of ordinary skill in the art to combine the light-emitting device of Chiyo/Yamazaki with the nitride light-emitting stack of Uemura. Motivation would be to increase both the luminous output and the lifetime of the light-emitting device.

8. In regard to claims 3, Chiyo/Yamazaki teach all the limitations set forth, as described above, except the first electrode is formed over the second surface and the second electrode is formed over the nitride second contact layer. Uemura et al ('062) teaches the first electrode (18B; paragraph 85) is formed over the second surface (see figure 1) and the second electrode (18A) is formed over the nitride second contact layer (17) in order to increase the luminous output of the device. Hence, it would have been obvious at the time of the invention to one of ordinary skill in the art to combine the light-emitting device

of Chiyo/Yamazaki with electrode formations of Uemura. Motivation would be to increase both the luminous output and the lifetime of the light-emitting device

9. In regard to claims 4 and 19, Chiyo/Yamazaki teach all the limitations set forth, as described above, except a first substrate comprising at least one material selected from a material group consisting of silicon, GaAs, glass, quartz, GaP, GaAsP, AlGaAs, and metal, or other substitute materials formed over the lower surface of the metal reflecting layer comprising a metal heat sink. Uemura et al ('062) teach a first substrate (103; figure 8; paragraphs 122-124, 126, 119) comprising at least one material selected from a material group consisting of silicon, GaAs, glass, quartz, GaP, GaAsP, AlGaAs, and metal, or other substitute materials (paragraphs 110-115) formed over the lower surface of the metal reflecting layer (102) in order to will increase both the luminous output and the lifetime of the light-emitting device. Hence, it would have been obvious at the time of the invention to one of ordinary skill in the art to combine the light-emitting device of Chiyo/Yamazaki with the substrate of Uemura. Motivation would be to increase both the luminous output and the lifetime of the light-emitting device.

10. In regard to claim 5, Chiyo/Yamazaki teach all the limitations set forth, as described above, except a metal heat sink formed over a lower surface of the first substrate. Uemura et al ('062) teach a metal heat sink (103; figure 11; paragraphs 135-136) comprising at least one material selected from a material group consisting of Sn, Al, Au, Pt, Zn, Ag, Pb, Pd, Ge, Cu, AuBe, AuGe, Ni, PbSn, and AuZn (paragraph 119) formed over a lower surface of the first substrate (102c) in order to will increase both the luminous output and the lifetime of the light-emitting device. Hence, it would have been obvious at the time of the invention to one of ordinary skill in the art to combine the light-emitting device of Chiyo/Yamazaki with the heat sink of Uemura. Motivation would be to increase both the luminous output and the lifetime of the light-emitting device.

11. In regard to claims 6 and 20, Chiyo/Yamazaki teach all the limitations set forth, as described above, except a metal heat sink formed over a lower surface of the metal reflecting layer comprising at least one material selected from a material group consisting of Sn, Al, Au, Pt, Zn, Ag, Pb, Pd, Ge, Cu, AuBe, AuGe, Ni, PbSn, and AuZn, or other substitute materials. Uemura et al ('062) teach a metal heat sink (103; figure 8; paragraph 122-124, 126, 119) formed over a lower surface of the metal reflecting layer (102) comprising at least one material selected from a material group consisting of Sn, Al, Au, Pt, Zn, Ag, Pb, Pd, Ge, Cu, AuBe, AuGe, Ni, PbSn, and AuZn (paragraph 119) in order to will increase both the luminous output and the lifetime of the light-emitting device. Hence, it would have been obvious at the time of the invention to one of ordinary skill in the art to combine the light-emitting device of Chiyo/Yamazaki with the heat sink of Uemura. Motivation would be to increase both the luminous output and the lifetime of the light-emitting device.

12. Claims 8, 9, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiyo et al (US 6100545) in view of Yamazaki et al (US 20030062519) and in further view of Sheu (US 20020179914) and Schetzina (US 5670798).

13. Chiyo/Yamazaki teach all the limitations set forth, as described above except a transparent conductive layer formed between the second reaction layer and the light-emitting stack layer, wherein the transparent conductive layer comprising a first surface and a second surface; the first electrode is formed over the first surface; the light-emitting stack layer is formed over the second surface; and the second electrode is formed over the light-emitting stack layer, wherein the transparent conductive layer comprises at least one material selected from a material group consisting of indium tin oxide, cadmium tin oxide, antimony tin oxide, zinc oxide, and zinc tin oxide. Sheu ('914) teaches a conductive layer

(buffer layer 104a; figure 3b; paragraphs 44-46) formed between a second reaction layer (102a; 100 being the first reaction layer) and the light-emitting stack layer (108), wherein the conductive layer comprising a first surface and a second surface (see figure 3b); the first electrode is formed over the first surface (116); the light-emitting stack layer is formed over the second surface (108); and the second electrode is formed over the light-emitting stack layer (114) in order to protect the light-emitting device from damage cause by electrostatic discharge (paragraph 11). Schetzina ('798) teaches a buffer layer (134; column 15 line 66 - column 16 line 48) for a light-emitting device as a transparent conductive layer comprises at least one material selected from a material group consisting of indium tin oxide, cadmium tin oxide, antimony tin oxide, zinc oxide, and zinc tin oxide (column 15 line 66 to column 16 line 22) in order to increase the lifetime of the light-emitting device (column 16 lines 20-49). Hence it would have been obvious at the time of the invention to one of ordinary skill in the art to combine the light-emitting device of Chiyo/Yamazaki with the transparent, conductive layer of Yamazaki and Sheu. Motivation to combine is to protect the light-emitting device from damage cause by electrostatic discharge and to increase the life span of the device.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth A. Rielley whose telephone number is 571-272-2117. The examiner can normally be reached on Monday - Friday 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elizabeth Rielley

Examiner
Art Unit 2879

7/11/05
Maricelí Santiago
AU 2879